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KUNZLER & ASSOCIATES
8 EAST BROADWAY
SUITE 600
SALT LAKE CITY, UT 84111

EXAMINER
COUGHLAN, PETER D

ART UNIT	PAPER NUMBER
2129	

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Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

	Application No.	Applicant(s)
Office Action Summary	10/644,378	FRY ET AL.
	Examiner	Art Unit	
	Peter Coughlan	2129	

-- *The MAILING DATE of this communication appears on the cover sheet with the correspondence address* --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>*20 August 2003*</u>.

2a)☐ This action is **FINAL.**   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-40* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-40* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *20 August 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All   b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date '*A*'.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

Detailed Action

1. . Claims 1-40 are pending in this application.

35 USC § 101

2. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 1-24, 30-40 are rejected under 35 U.S.C. 101 for nonstatutory subject matter. The computer system must set forth a practical application of that § 101 judicial exception to produce a real-world result. Benson, 409 U.S. at 71-72, 175 USPQ at 676-77. The invention is ineligible because it has not been limited to a substantial practical application. Some claims state the generation of an algorithm that predicts failure is an exercise only and lacks a practical application. The remaining claims only state a 'result' without describing a specific 'result' and thus are also lacking a practical application. The result has to be a practical application. Please see the interim guidelines for examination of patent applications for patent subject matter eligibility published November 22, 2005 in the official gazette.

In determining whether the claim is for a "practical application," the focus is not on whether the steps taken to achieve a particular result are useful, tangible and

concrete, but rather that the <u>final result</u> achieved by the claimed invention is "useful, tangible and concrete." If the claim is directed to a practical application of the § 101 judicial exception producing a result tied to the physical world that does not preempt the judicial exception, then the claim meets the statutory requirement of 35 U.S.C. § 101. Phrases such as 'developing failure prediction software', 'prediction algorithm on the performance data to produce a result' and 'failure prediction algorithm such that the result corresponds to the expected result' are vague in meaning at best.

The invention must be for a practical application and either:

1) specify transforming (physical thing) or

2) have the FINAL RESULT (not the steps) achieve or produce a

useful (specific, substantial, AND credible),

concrete (substantially repeatable/ non-unpredictable), AND

tangible (real world/ non-abstract) result.

A claim that is so broad that it reads on both statutory and non-statutory subject matter, must be amended, <u>and if the specification discloses a practical application but the claim is broader than the disclosure such that it does not require the practical application, then the claim must be amended</u>.

A portion of claim 25 states 'selectively forecasting failure of one or more components' discloses enough information to state what the practical application of the invention is. The remaining claims are too vague or non descriptive to overcome the 35 U.S.C. §101 rejection.

Claim Rejections - 35 USC § 112

3.   The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claim 37 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Claim 37 recites the limitation "fuzzy logic rules B" which is not in the specification. ·

This claim needs to be withdrawn from consideration or amended.

Claims 3, 21, 26, 32, 38 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. All these claims have 'adjusting a fuzzy variable' but the specification has no mention of performing this or the motivational reason why this is necessary.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly
claiming the subject matter which the applicant regards as his invention.

Claim 37 recites the limitation "fuzzy logic rules B" in 36. There is insufficient

antecedent basis for this limitation in the claim. There are no 'fuzzy logic rules B' in

claim 36.

This claims needs to be amended or withdrawn from consideration.

Claim Rejections - 35 USC § 102

4.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that
form the basis for the rejections under this section made in this Office action:
A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a
foreign country or in public use or on sale in this country, more than one year
prior to the date of application for patent in the United States.

Claims 7, 13 are rejected under 35 U.S.C. 102(b) (hereinafter referred to as

Ottesen) being anticipated by Ottesen et al., U.S. 6314377.

Claim 7

Ottesen teaches a performance monitor configured to gather performance data

for a storage system (**Ottesen,** abstract; 'Storage system' of applicant is equivalent to

'drive array' of Ottesen.); a processor configured to execute a failure prediction

algorithm on the performance data to produce a result, the failure prediction algorithm

comprising fuzzy logic rules(**Ottesen,** C3:46-48, C4:32-55; 'Fuzzy logic rules' of

applicant is equivalent to 'fuzzy logic membership' of Ottesen. 'Processor' of applicant is

equivalent to 'multiprocessor' of Ottesen.); and a determination module configured to

selectively forecast failure of one or more components of the storage system in

response to the result. (**Ottesen,** C1:62 through C2:6; A 'determination module' of

applicant is executed by the 'prediction failure analysis' of Ottesen.)

Claim 13

Ottesen teaches a controller configured to control and manage data transactions

with a host (**Ottesen,** C4:56 through C5:10; 'Controller' of applicant is equivalent to

'CPU' of Ottesen.); a communication module configured to exchange data between the

host and a storage media (**Ottesen,** C4:56 through C5:10; 'Communication module' of

applicant is equivalent to 'system bus' of Ottesen.); a drive mechanism configured to

read data from the storage media and write data to the storage media (**Ottesen,** C4:56

through C5:10; Reading and writing data into a storage media of applicant is equivalent

to 'typically include a control unit that organizes data and program storage in a

computer memory and transfer the data and other information between the various

parts of the computer system' of Ottesen.); and an analysis module configured to

execute machine-readable code programmed to selectively predict failure of the storage

media(**Ottesen,** abstract; 'Storage media' of applicant is equivalent to 'drive array' of

Ottesen.) and the drive mechanism in response to a result from a failure prediction

algorithm comprising fuzzy logic rules and performance data associated with the

storage media and the drive mechanism. (**Ottesen,** C1:62 through C2:6, C3:46-48;

'Failure prediction algorithm' of applicant is equivalent to 'prediction failure analysis' of

Ottesen. 'Fuzzy logic rules' of applicant is equivalent to 'fuzzy logic membership' of

Ottesen.)

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed
> or described as set forth in section 102 of this title, if the differences between the
> subject matter sought to be patented and the prior art are such that the subject
> matter as a whole would have been obvious at the time the invention was made
> to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was
> made.

Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ottesen

as set forth above, in view of Awadallah. ('Application of AI tools in fault diagnosis of

electrical machines and drives-an overview', referred to as **Awadallah**)

Claim 14

Ottesen does not teach the machine-readable code further comprises an

interface configured to selectively adjust a fuzzy variable definition to tune the failure

prediction algorithm.

Awadallah teaches the machine-readable code further comprises an interface

configured to selectively adjust a fuzzy variable definition to tune the failure prediction

algorithm. (**Awadallah,** p249, C1:29-48; 'Adjust a fuzzy variable definition' of applicant

is equivalent to 'adjust the system parameter set' of Awadallah.) It would have been

obvious to a person having ordinary skill in the art at the time of applicant's invention to

modify the teachings of Ottesen by being able to make corrections as taught by

Awadallah to have the machine-readable code further comprises an interface

configured to selectively adjust a fuzzy variable definition to tune the failure prediction

algorithm.

For the purpose of having the algorithm being able to produce a desired result.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed
> or described as set forth in section 102 of this title, if the differences between the
> subject matter sought to be patented and the prior art are such that the subject
> matter as a whole would have been obvious at the time the invention was made
> to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was
> made.

Claims 1, 2, 3, 4, 6 are rejected under 35 U.S.C. 103(a) as being unpatentable

over the combination of Ottesen and Awadallah in view of Preston. (U. S. Patent

6446081, referred to as **Preston**)

Claim 1

Ottesen teaches an editor configured to assist a user in generating a failure

prediction algorithm comprising fuzzy logic rules, the failure prediction algorithm stored

in a human-readable format. (**Ottesen,** C1:62 through C2:6, C3:46-48, C4:32-55;

'Failure prediction algorithm' of applicant is equivalent to 'prediction failure analysis' of

Ottesen. 'Fuzzy logic rules' of applicant is equivalent to 'fuzzy logic membership' of

Ottesen. 'Human readable format' of applicant is equivalent to 'graphic user interface' of

Ottesen.)

Ottesen and Awadallah do not teach a code generator configured to generate

machine-readable code from the stored failure prediction algorithm.

Preston teaches a code generator configured to generate machine-readable code from the stored failure prediction algorithm. (**Preston,** C2:46-51; 'Code generator' of applicant is equivalent to 'code generator' of Preston.) It would have been obvious to a person having ordinary skill in the art at the time of applicant's invention to modify the combined teachings of Ottesen and Awadallah by using a code generator as taught by Preston to have a code generator configured to generate machine-readable code from the stored failure prediction algorithm.

For the purpose of having the invention to generate code itself without requiring user skill to provide the expertise to generate code.

Ottesen does not teach a test module configured to test the machine-readable code with sample data to produce a result; and a revision module configured to allow revisions of the failure prediction algorithm such that the result corresponds to an expected result.

Awadallah teaches a test module configured to test the machine-readable code with sample data to produce a result (**Awadallah,** p249, C1:20-21; 'Test module' of applicant is equivalent to 'training' of Awadallah.); and a revision module configured to allow revisions of the failure prediction algorithm such that the result corresponds to an expected result. (**Awadallah,** p249, C1:29-48; 'Allow revisions' of applicant is equivalent to 'adjust the system parameter set' of Awadallah.) It would have been obvious to a person having ordinary skill in the art at the time of applicant's invention to modify the teachings of Ottesen by using teat data with a test module as taught by Awadallah to have a test module configured to test the machine-readable code with sample data to

produce a result; and a revision module configured to allow revisions of the failure

prediction algorithm such that the result corresponds to an expected result.

For the purpose of setting up the system to perform as the user needs or

requires.

Claim 2

Ottesen and Awadallah linguistic variables having less than four terms.

Preston teaches linguistic variables having less than four terms. (**Preston,**

C6:34-64; 'Less than four items' of applicant is equivalent to 'nouns, verbs and

adjectives' of Preston.) It would have been obvious to a person having ordinary skill in

the art at the time of applicant's invention to modify the combined teachings of Ottesen

and Awadallah by having only 3 terms for input as taught by Preston to have linguistic

variables having less than four terms.

For the purpose of keeping conditional statements down to a manageable size.

Claim 3

Ottesen teaches the test module is further configured to tune the failure

prediction algorithm by adjusting a fuzzy variable definition.

Awadallah teaches the test module is further configured to tune the failure

prediction algorithm by adjusting a fuzzy variable definition. (**Awadallah,** p249, C1:29-

48; 'Tune the failure prediction algorithm' of applicant is equivalent to 'adjust the system

parameter set' of Awadallah.) It would have been obvious to a person having ordinary

skill in the art at the time of applicant's invention to modify the teachings of Ottesen by having another adjustment of the fuzzy variable as taught by Awadallah to tune the failure prediction algorithm by adjusting a fuzzy variable definition.

For the purpose of setting up the system to perform as the user needs or requires.

Claim 4

Ottesen teaches the machine-readable code is configured to execute on a storage system.(**Ottesen,** abstract; 'Storage system' of applicant is equivalent to 'drive array' of Ottesen.)

Claim 6

Ottesen does not teach the fuzzy logic rules are defined by conditional statements that include subjects, adjectives, and verbs familiar to personnel in the storage system field.

Awadallah teaches the fuzzy logic rules are defined by conditional statements. (**Awadallah,** p249, C1:29-48; 'Conditional statements' of applicant is equivalent to 'if-then statements' of Awadallah.) It would have been obvious to a person having ordinary skill in the art at the time of applicant's invention to modify the teachings of Ottesen by implementing conditional statements as taught by Awadallah to have the fuzzy logic rules are defined by conditional statements.

For the purpose of using standard if-then statements for fuzzy logic implementations.

Preston teaches that include subjects, adjectives, and verbs familiar to personnel in the storage system field. (**Preston,** C6:34-64; 'Subjects, adjectives and verbs' of applicant is equivalent to 'nouns, verbs and adjectives' of Preston.) It would have been obvious to a person having ordinary skill in the art at the time of applicant's invention to modify the combined teachings of Ottesen and Awadallah by using natural language terms as taught by Prestonto have subjects, adjectives, and verbs familiar to personnel in the storage system field.

For the purpose of using a users natural language for input variables to lower the learning curve of the invention.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 5, 18-24, 30-39 are rejected under 35 U.S.C. 103(a) as being

unpatentable over the combination of Ottesen, Awadallah and Preston in view of Heller.

(U. S. Patent 4907230, referred to as **Heller**)

Claim 5

Ottesen, Awadallah and Preston the revision module comprises a text editor

configured to revise the failure prediction algorithm.

Heller teaches the revision module comprises a text editor configured to revise

the failure prediction algorithm. (**Heller,** C23:43-48; 'Text editor' of applicant is

equivalent to 'text editor' of Heller.) It would have been obvious to a person having

ordinary skill in the art at the time of applicant's invention to modify the combined

teachings of Ottesen, Awadallah and Preston by using a text editor as taught by Heller

to have the revision module comprises a text editor configured to revise the failure

prediction algorithm.

For the purpose of reducing the learning curve for the user due to the fact that

text editors are established and known software.

Claim 18

Ottesen teaches generating a failure prediction algorithm comprising fuzzy logic

rules, the failure prediction algorithm stored in a human-readable format. (**Ottesen,**

C1:62 through C2:6, C3:46-48, C4:32-55; 'Failure prediction algorithm' of applicant is

equivalent to 'prediction failure analysis' of Ottesen. 'Fuzzy logic rules' of applicant is

equivalent to 'fuzzy logic membership' of Ottesen. 'Human readable format' of applicant

is equivalent to 'graphic user interface' of Ottesen.)

Ottesen, Awadallah do not teach generating machine-readable code from the

stored failure prediction algorithm.

Preston teaches generating machine-readable code from the stored failure

prediction algorithm. (**Preston,** C2:46-51; 'Generating machine-readable code' of

applicant is equivalent to 'code generator' of Preston.) It would have been obvious to a

person having ordinary skill in the art at the time of applicant's invention to modify the

combined teachings of Ottesen, Awadallah by using established technology as taught

by Preston to have generating machine-readable code from the stored failure prediction

algorithm.

For the purpose of being able to use existing technology for implementation of

the invention.

Ottesen, Awadallah and Preston do not teach testing the machine-readable code

to produce a result.

Heller teaches testing the machine-readable code to produce a result. (**Heller,**

abstract; Heller discloses output from sensors being intregrated ito a host

microcomputer to produce test results.) It would have been obvious to a person having

ordinary skill in the art at the time of applicant's invention to modify the combined

teachings of Ottesen, Awadallah and Preston by outputting a result as taught by Heller

to testing the machine-readable code to produce a result.

For the purpose of setting up the system to perform as the user needs or requires.

Ottesen does not teach selectively revising the failure prediction algorithm such that the result corresponds to an expected result.

Awadallah teaches selectively revising the failure prediction algorithm such that the result corresponds to an expected result. (**Awadallah,** p249, C1:29-48; 'Selective revising' of applicant is equivalent to 'adjust the system parameter set' of Awadallah.) It would have been obvious to a person having ordinary skill in the art at the time of applicant's invention to modify the teachings of Ottesen by adjusting the algorithm as taught by Awadallah to selectively revising the failure prediction algorithm such that the result corresponds to an expected result.

For the purpose of achieving desired results.

Claim 19

Ottesen and Awadallah do not teach the fuzzy logic rules comprise linguistic variables having less than four terms.

Preston teaches the fuzzy logic rules comprise linguistic variables having less than four terms. (**Preston,** C6:34-64; 'Less than four items' of applicant is equivalent to 'nouns, verbs and adjectives' of Preston.) It would have been obvious to a person having ordinary skill in the art at the time of applicant's invention to modify the combined teachings of Ottesen and Awadallah by having a small number in inputs as taught by

Preston to have the fuzzy logic rules comprise linguistic variables having less than four

terms.

For the purpose of having a small number in inputs allows the conditional fuzzy

logic rules to be a manageable size.

Claim 20

Ottesen and Awadallah do not teach wherein certain linguistic variables comprise

less than three terms.

Preston teaches wherein certain linguistic variables comprise less than three

terms. (**Preston,** C6:34-64; 'Less than three items' of applicant is equivalent to 'nouns

and verbs' of Preston.) It would have been obvious to a person having ordinary skill in

the art at the time of applicant's invention to modify the combined teachings of Ottesen

and Awadallah by having a small number of inputs as taught by Preston to have

wherein certain linguistic variables comprise less than three terms.

For the purpose of having a small number in inputs allows the conditional fuzzy

logic rules to be a manageable size.

Claim 21

Ottesen does not teach tuning the failure prediction algorithm by adjusting a

fuzzy variable definition.

Awadallah teaches tuning the failure prediction algorithm by adjusting a fuzzy

variable definition. (**Awadallah,** p249, C1:29-48; 'Tuning the failure prediction algorithm'

of applicant is equivalent to 'adjust the system parameter set' of Awadallah.) It would

have been obvious to a person having ordinary skill in the art at the time of applicant's

invention to modify the teachings of Ottesen by being able to make adjustments as

taught by Awadallah to tuning the failure prediction algorithm by adjusting a fuzzy

variable definition.

For the purpose of the invention being able to be modified to fit the users needs

and accuracy requirements.

Claim 22

Ottesen teaches the machine-readable code is configured to execute on a

storage system. (**Ottesen,** abstract; 'Storage system' of applicant is equivalent to 'drive

array' of Ottesen.)

Claim 23

Ottesen, Awadallah and Preston do not teach revising the failure prediction

algorithm by way of a text editor.

Heller teaches revising the failure prediction algorithm by way of a text editor.

(**Heller,** C23:43-48; 'Text editor' of applicant is equivalent to 'text editor' of Heller.) It

would have been obvious to a person having ordinary skill in the art at the time of

applicant's invention to modify the combined teachings of Ottesen, Awadallah and

Preston by using a text editor as taught by Heller to revising the failure prediction

algorithm by way of a text editor.

For the purpose of using established and reliable technology for editing the prediction algorithm

Claim 24

Ottesen and Awadallah do not teach the fuzzy logic rules are defined by conditional statements that include subjects, adjectives, and verbs familiar to personnel in the storage system field.

Preston teaches the fuzzy logic rules are defined by conditional statements that include subjects, adjectives, and verbs familiar to personnel in the storage system field. (**Preston,** C6:34-64; 'Subjects, adjectives and verbs' of applicant is equivalent to 'nouns, verbs and adjectives' of Preston.) It would have been obvious to a person having ordinary skill in the art at the time of applicant's invention to modify the combined teachings of Ottesen and Awadallah by using linguistics terms as taught by Preston to have the fuzzy logic rules are defined by conditional statements that include subjects, adjectives, and verbs familiar to personnel in the storage system field.

For the purpose of using the natural language of the user for ease of use to define conditional statements.

Claim 30

Ottesen teaches means for generating a failure prediction algorithm comprising fuzzy logic rules, the failure prediction algorithm stored in a human-readable format. (**Ottesen,** C1:62 through C2:6, C3:46-48, C4:32-55; 'Failure prediction algorithm' of

applicant is equivalent to 'prediction failure analysis' of Ottesen. 'Fuzzy logic rules' of

applicant is equivalent to 'fuzzy logic membership' of Ottesen. 'Human readable format'

of applicant is equivalent to 'graphic user interface' of Ottesen.)

Ottesen and Awadallah do not teach means for generating machine-readable

code from the stored failure prediction algorithm.

Preston teaches means for generating machine-readable code from the stored

failure prediction algorithm. (**Preston,** C2:46-51; 'Generating machine-readable code' of

applicant is equivalent to 'code generator' of Preston.) It would have been obvious to a

person having ordinary skill in the art at the time of applicant's invention to modify the

combined teachings of Ottesen and Awadallah by using standard storage protocol as

taught by Preston to have the means for generating machine-readable code from the

stored failure prediction algorithm.

For the purpose of using established technology for implementation into current

computer systems.

Ottesen, Awadallah and Preston do not teach means for testing the machine-

readable code to produce a result.

Heller teaches means for testing the machine-readable code to produce a result.

(**Heller,** abstract; Heller discloses output from sensors being intregrated ito a host

microcomputer to produce test results.) It would have been obvious to a person having

ordinary skill in the art at the time of applicant's invention to modify the combined

teachings of Ottesen, Awadallah and Preston by being able to test the invention as

taught by Heller to have means for testing the machine-readable code to produce a result.

For the purpose of using the algorithm for its intended purpose of prediction and storage devices.

Ottesen does not teach means for selectively revising the failure prediction algorithm such that the con result corresponds to an expected result.

Awadallah teaches means for selectively revising the failure prediction algorithm such that the con result corresponds to an expected result. (**Awadallah,** p249, C1:29-48; 'Revising the failure prediction algorithm' of applicant is equivalent to 'adjust the system parameter set' of Awadallah.) It would have been obvious to a person having ordinary skill in the art at the time of applicant's invention to modify the teachings of Ottesen by editing the algorithm for improved results as taught by Awadallah to have means for selectively revising the failure prediction algorithm such that the con result corresponds to an expected result.

For the purpose of modifying the initial algorithm so results and reflect the users needs and accuracy requirements.

Claim 31

Ottesen and Awadallah do not teach the fuzzy logic rules comprise linguistic variables having less than four terms.

Preston teaches the fuzzy logic rules comprise linguistic variables having less than four terms. (**Preston,** C6:34-64; 'Less than four items' of applicant is equivalent to

'nouns, verbs and adjectives' of Preston.) It would have been obvious to a person

having ordinary skill in the art at the time of applicant's invention to modify the combined

teachings of Ottesen and Awadallah by using 3 variables as taught by Preston to have

the fuzzy logic rules comprise linguistic variables having less than four terms.

For the purpose of keeping the conditional statements down to a manageable

size.

Claim 32

Ottesen does not teach means for tuning the failure prediction algorithm by

adjusting a fuzzy variable definition.

Awadallah teaches means for tuning the failure prediction algorithm by adjusting

a fuzzy variable definition. (**Awadallah,** p249, C1:29-48; 'Adjust a fuzzy variable

definition' of applicant is equivalent to 'adjust the system parameter set' of Awadallah.) It

would have been obvious to a person having ordinary skill in the art at the time of

applicant's invention to modify the teachings of Ottesen by being able to adjust the

algorithm as taught by Awadallah for tuning the failure prediction algorithm by adjusting

a fuzzy variable definition.

For the purpose of modifying the initial algorithm so results and reflect the users

needs and accuracy requirements.

Claim 33

Ottesen teaches the machine-readable code is configured to execute on a

storage system. (**Ottesen,** abstract; 'Storage system' of applicant is equivalent to 'drive

array' of Ottesen.)

Claim 34

Ottesen, Awadallah and Preston do not teach means for revising the failure

prediction algorithm by way of a text editor.

Heller teaches means for revising the failure prediction algorithm by way of a text

editor. (**Heller,** C23:43-48; 'Text editor' of applicant is equivalent to 'text editor' of

Heller.) It would have been obvious to a person having ordinary skill in the art at the

time of applicant's invention to modify the combined teachings of Ottesen, Awadallah

and Preston by using a text editor as taught by Heller to have means for revising the

failure prediction algorithm by way of a text editor.

For the purpose of using established and reliable technology for ensuring editing

the algorithm correctly.

Claim 35

Ottesen and Awadallah do not teach the fuzzy logic rules are defined by

conditional statements that include subjects, adjectives, and verbs familiar to personnel

in the storage system field.

Preston teaches the fuzzy logic rules are defined by conditional statements that

include subjects, adjectives, and verbs familiar to personnel in the storage system field.

(**Preston,** C6:34-64; 'Subjects, adjectives and verbs' of applicant is equivalent to

'nouns, verbs and adjectives' of Preston.) It would have been obvious to a person

having ordinary skill in the art at the time of applicant's invention to modify the combined

teachings of Ottesen and Awadallah by using linguistics terms for variables as taught by

Preston to have the fuzzy logic rules are defined by conditional statements that include

subjects, adjectives, and verbs familiar to personnel in the storage system field.

For the purpose of using the natural language of the user to make it easier for the

user to implement the invention.

Claim 36

Ottesen teaches generating a failure prediction algorithm comprising fuzzy logic

rules, the failure prediction algorithm stored in a human-readable format. (**Ottesen,**

C1:62 through C2:6, C3:46-48, C4:32-55; 'Failure prediction algorithm' of applicant is

equivalent to 'prediction failure analysis' of Ottesen. 'Fuzzy logic rules' of applicant is

equivalent to 'fuzzy logic membership' of Ottesen. 'Human readable format' of applicant

is equivalent to 'graphic user interface' of Ottesen.)

Ottesen and Awadallah do not teach generating machine-readable code from the

stored failure prediction algorithm.

Preston teaches generating machine-readable code from the stored failure

prediction algorithm. (**Preston,** C2:46-51; 'Generating machine-readable code' of

applicant is equivalent to 'code generator' of Preston.) It would have been obvious to a

person having ordinary skill in the art at the time of applicant's invention to modify the

combined teachings of Ottesen and Awadallah by using standard storage protocols for storing the algorithm as taught by Preston to have a generating machine-readable code from the stored failure prediction algorithm.

For the purpose of using existing technology and protocols making the invention easier to implement into a current computer system.

Ottesen, Awadallah and Preston do not teach testing the machine-readable code to produce a result.

Heller teaches testing the machine-readable code to produce a result. (**Heller,** abstract; Heller discloses output from sensors being intregrated ito a host microcomputer to produce test results.) It would have been obvious to a person having ordinary skill in the art at the time of applicant's invention to modify the combined teachings of Ottesen, Awadallah and Preston by outputting an answer as taught by Heller to testing the machine-readable code to produce a result.

For the purpose of using the invention for its intended purpose of predicting failure of storage devices.

Ottesen does not teach selectively revising the failure prediction algorithm such that the result corresponds to an expected result.

Awadallah teaches selectively revising the failure prediction algorithm such that the result corresponds to an expected result. (**Awadallah,** p249, C1:29-48; 'Revising the failure prediction algorithm' of applicant is equivalent to 'adjust the system parameter set' of Awadallah.) It would have been obvious to a person having ordinary skill in the art at the time of applicant's invention to modify the teachings of Ottesen by

being able to alter the algorithm as taught by Awadallah to have selectively revising the failure prediction algorithm such that the result corresponds to an expected result.

For the purpose of adjusting the invention to fulfill the users needs and accuracy requirements.

Claim 37

Ottesen and Awadallah do not teach the fuzzy logic rules B comprise simple conditional statements that include subjects, adjectives, and verbs that are commonly used to describe error conditions of a storage system.

Preston teaches the fuzzy logic rules B comprise simple conditional statements that include subjects, adjectives, and verbs that are commonly used to describe error conditions of a storage system. (**Preston,** C6:34-64; 'Subjects, adjectives and verbs' of applicant is equivalent to 'nouns, verbs and adjectives' of Preston.) It would have been obvious to a person having ordinary skill in the art at the time of applicant's invention to modify the combined teachings of Ottesen and Awadallah by using if-then statements along with natural language variables as taught by Preston to have the fuzzy logic rules B comprise simple conditional statements that include subjects, adjectives, and verbs that are commonly used to describe error conditions of a storage system.

For the purpose of natural language variables to ease the implementation of the conditional statements.

Claim 38

Ottesen does not teach tuning the failure prediction algorithm by adjusting a fuzzy variable definition.

Awadallah teaches tuning the failure prediction algorithm by adjusting a fuzzy variable definition. (**Awadallah,** p249, C1:29-48; 'Adjust a fuzzy variable definition' of applicant is equivalent to 'adjust the system parameter set' of Awadallah.) It would have been obvious to a person having ordinary skill in the art at the time of applicant's invention to modify the teachings of Ottesen by being able to adjust the defination as taught by Awadallah to tuning the failure prediction algorithm by adjusting a fuzzy variable definition.

For the purpose of the invention to reach a desired goal and perform for the user to obtain needs and accuracy requirements.

Claim 39

Ottesen, Awadallah and Preston do not teach revising the failure prediction algorithm by way of a text editor.

Heller teaches revising the failure prediction algorithm by way of a text editor. (**Heller,** C23:43-48; 'Text editor' of applicant is equivalent to 'text editor' of Heller.) It would have been obvious to a person having ordinary skill in the art at the time of applicant's invention to modify the combined teachings of Ottesen, Awadallah and Preston by using a text editor as taught by Heller to revising the failure prediction algorithm by way of a text editor.

The purpose of using established technology such as a text editor to reduce the

learning curve for the invention's use.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed
> or described as set forth in section 102 of this title, if the differences between the
> subject matter sought to be patented and the prior art are such that the subject
> matter as a whole would have been obvious at the time the invention was made
> to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was
> made.

Claim 40 is rejected under 35 U.S.C. 103(a) as being unpatentable over the

combination of Ottesen, Awadallah, Preston and Heller in view of Higgens. (U. S. Patent

6397202, referred to as **Higgens**)

Claim 40.

Ottesen, Awadallah, Preston and Heller do not teach adding fuzzy logic rules to

the failure prediction algorithm.

Higgins teaches adding fuzzy logic rules to the failure prediction algorithm.

(**Higgins,** C2:31-40; Higgins discloses the addition to existing rules.) It would have been

obvious to a person having ordinary skill in the art at the time of applicant's invention to

modify the combined teachings of Ottesen, Awadallah, Preston and Heller by being able

to add additional rules as taught by Higgins to adding fuzzy logic rules to the failure

prediction algorithm.

For the purpose of being able to expand the capabilities of the invention.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed
> or described as set forth in section 102 of this title, if the differences between the
> subject matter sought to be patented and the prior art are such that the subject
> matter as a whole would have been obvious at the time the invention was made
> to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negated by the manner in which the invention was
> made.

Claim 25 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ottesen

in view of Heller. (U. S. Patent 4907230, referred to as **Heller**)

Claim 25

Ottesen does not teach gathering performance data for a storage system.

Heller teaches gathering performance data for a storage system. (**Heller,** C19:59

through C20:2; 'Provide pre-process performance data' of applicant is equivalent to

'driver/sensor circuitry to gather data' of Heller.) It would have been obvious to a person

having ordinary skill in the art at the time of applicant's invention to modify the teachings

of Ottesen by collecting data concerning the storage system as taught by Heller to

gather performance data for a storage system.

For the purpose of being able to use the invention, incoming data concerning the

status of the storage system is needed.

Ottesen teaches executing a failure prediction algorithm on the performance data

to produce a result, the failure prediction algorithm comprising fuzzy logic rules

(**Ottesen,** C1:62 through C2:6, C3:46-48; 'Failure prediction algorithm' of applicant is

equivalent to 'prediction failure analysis' of Ottesen. 'Fuzzy logic rules' of applicant is

equivalent to 'fuzzy logic membership' of Ottesen.); and selectively forecasting failure of

one or more components of the storage system in response to the result. (**Ottesen,**

abstract; 'Storage system' of applicant is equivalent to 'drive array' of Ottesen.)

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed
> or described as set forth in section 102 of this title, if the differences between the
> subject matter sought to be patented and the prior art are such that the subject
> matter as a whole would have been obvious at the time the invention was made
> to a person having ordinary skill in the art to which said subject matter pertains.

Patentability shall not be negatived by the manner in which the invention was made.

Claims 15, 26, 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Ottesen and Heller in view of Awadallah. ('Application of AI tools in fault diagnosis of electrical machines and drives—an overview', referred to as **Awadallah**)

Claim 15

Ottesen does not teach the machine-readable code further comprises a pre-processor configured to pre-process performance data to provide input data for the failure prediction algorithm.

Heller teaches the machine-readable code further comprises a pre-processor configured to pre-process performance data to provide input data for the failure prediction algorithm. (**Heller,** C19:59 through C20:2; 'Pre-processor to provide pre-process performance data' of applicant is equivalent to 'driver/sensor circuitry to gather data' of Heller.) It would have been obvious to a person having ordinary skill in the art at the time of applicant's invention to modify the teachings of Ottesen by doing initial arranging of data as taught by Heller to have a pre-processor configured to pre-process performance data to provide input data for the failure prediction algorithm.

For the purpose of the system to use information in a form which it can use.

Claim 26

Ottesen and Heller do not teach tuning the failure prediction algorithm by adjusting a fuzzy variable definition.

Awadallah teaches tuning the failure prediction algorithm by adjusting a fuzzy variable definition. (**Awadallah,** p249, C1:29-48; 'Adjust a fuzzy variable definition' of applicant is equivalent to 'adjust the system parameter set' of Awadallah.) It would have been obvious to a person having ordinary skill in the art at the time of applicant's invention to modify the combined teachings of Ottesen and Heller by being able to alter a defination as taught by Awadallah to tuning the failure prediction algorithm by adjusting a fuzzy variable definition.

For the purpose of modifying the definition so results that fulfill the user needs and accuracy requirements are achieved.

Claim 29

Ottesen does not teach pre-processing performance data to provide input data for the failure prediction algorithm.

Heller teaches pre-processing performance data to provide input data for the failure prediction algorithm. (**Heller,** C19:59 through C20:2; 'Pre-processor to provide pre-process performance data' of applicant is equivalent to 'driver/sensor circuitry to gather data' of Heller.) It would have been obvious to a person having ordinary skill in the art at the time of applicant's invention to modify the teachings of Ottesen by altering incoming data as taught by Heller to have pre-processing performance data to provide input data for the failure prediction algorithm.

For the purpose of altering incoming data and put it in a form which the invention

can use.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed
> or described as set forth in section 102 of this title, if the differences between the
> subject matter sought to be patented and the prior art are such that the subject
> matter as a whole would have been obvious at the time the invention was made
> to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was
> made.

Claims 16, 17, 27, 28 are rejected under 35 U.S.C. 103(a) as being unpatentable

over the combination of Ottesen, Heller and Awadallah in view of Guay. (US Patent

6553369, referred to as **Guay**)

Claim 16

Ottesen, Heller and Awadallah do not teach the machine-readable code further

comprises a determination module configured to map a result from the failure prediction

algorithm to one of a plurality of predefined recommendations.

Guay teaches the machine-readable code further comprises a determination

module configured to map a result from the failure prediction algorithm to one of a

plurality of predefined recommendations. (**Guay,** C5:62 through C6:8; 'Predefined

recommendations' of applicant is equivalent to 'providing recommendations' of Guay.) It

would have been obvious to a person having ordinary skill in the art at the time of

applicant's invention to modify the combined teachings of Ottesen, Heller and

Awadallah by using predefined recommendations as taught by Guay to have the

machine-readable code further comprises a determination module configured to map a

result from the failure prediction algorithm to one of a plurality of predefined

recommendations.

For the purpose of producing resulting answers that are commonly used.

Claim 17

Ottesen, Heller and Awadallah do not teach the machine-readable code further

comprises a notification module configured to produce a notification in response to the

result.

Guay teaches the machine-readable code further comprises a notification

module configured to produce a notification in response to the result. (**Guay,** C5:62

through C6:8; 'Producing a notification' of applicant is equivalent to the output of

'providing recommendations' of Guay.) It would have been obvious to a person having

ordinary skill in the art at the time of applicant's invention to modify the combined

teachings of Ottesen, Heller and Awadallah by having an indicator of a response as

taught by Guay to have machine-readable code further comprises a notification module

configured to produce a notification in response to the result.

For the purpose of actually producing a result that the user can use.

Claim 27

Ottesen, Heller and Awadallah do not teach mapping the result to one of a plurality of predefined recommendations.

Guay teaches mapping the result to one of a plurality of predefined recommendations. (**Guay,** C5:62 through C6:8; 'Predefined recommendations' of applicant is equivalent to 'providing recommendations' of Guay.) It would have been obvious to a person having ordinary skill in the art at the time of applicant's invention to modify the combined teachings of Ottesen, Heller and Awadallah by using predefined recommendations as taught by Guay to have a mapping the result to one of a plurality of predefined recommendations.

For the purpose of using results that are commonly occurring with storage failures

Claim 28

Ottesen, Heller and Awadallah do not teach producing a notification in response to the result.

Guay teaches producing a notification in response to the result. (**Guay,** C5:62 through C6:8; 'Producing a notification' of applicant is equivalent to the output of 'providing recommendations' of Guay.) It would have been obvious to a person having ordinary skill in the art at the time of applicant's invention to modify the combined

teachings of Ottesen, Heller and Awadallah by outputting a response as taught by Guay

to produce a notification in response to the result.

For the purpose of outputting a response so that a user can use the information

which the invention generated.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed
> or described as set forth in section 102 of this title, if the differences between the
> subject matter sought to be patented and the prior art are such that the subject
> matter as a whole would have been obvious at the time the invention was made
> to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was
> made.

Claims 8, 9, 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over

Ottesen in view of the combination of Heller, Awadallah and Jones. (U.S. Patent

4907230, referred to as **Heller;** 'Application of AI tools in fault diagnosis of electrical

machines and drives—an overview', referred to as **Awadallah;** U.S. Patent 6219805,

referred to as **Jones)**

Claim 8

Ottesen does not teach an interface configured to adjust a predefined quality

threshold of the determination module to adjust the degree of data loss risk and

remedial costs associated with a forecasted failure of one or more components.

Heller teaches an interface configured to adjust. (**Heller,** C23:43-48; 'Interface' of

applicant is equivalent to 'text editor' of Heller.) Awadallah teaches a predefined quality

threshold. (**Awadallah,** p248, C2:50 through p259, C1:5) Jones teaches the

determination module to adjust the degree of data loss risk and remedial costs

associated with a forecasted failure of one or more components. (**Jones,** C2:18-31 and

C6:34-48; 'Data loss risk' of applicant is evaluated by the 'risk analyzer' of Jones.

'Remedial cost' of applicant is equivalent to 'expected repair cost' of Jones.) It would

have been obvious to a person having ordinary skill in the art at the time of applicant's

invention to modify the teachings of Ottesen by using an interface to adjust a threshold

to alter remedial cost and possible data loss as taught by the combination of Heller,

Awadallah and Jones to have an interface configured to adjust a predefined quality

threshold of the determination module to adjust the degree of data loss risk and

remedial costs associated with a forecasted failure of one or more components.

For the purpose of using a plurality of elements of the invention in combination to

have an interface with the invention and use the invention components.

Claim 9

Ottesen does not teach an interface configured to adjust a fuzzy variable

definition to tune the failure prediction algorithm.

Awadallah teaches an interface configured to adjust a fuzzy variable definition to tune the failure prediction algorithm. (**Awadallah,** p249, C1:29-48; 'Adjust a fuzzy variable definition' of applicant is equivalent to 'adjust the system parameter set' of Awadallah.) It would have been obvious to a person having ordinary skill in the art at the time of applicant's invention to modify the teachings of Ottesen by being able to adjust definations as taught by Awadallah to have an interface configured to adjust a fuzzy variable definition to tune the failure prediction algorithm.

For the purpose of being able to adjust the definition to produce a result to fit the needs and accuracy requirements of the user.

Claim 10

Ottesen does not teach a pre-processor configured to pre-process performance data to provide input data for the failure prediction algorithm.

Heller teaches a pre-processor configured to pre-process performance data to provide input data for the failure prediction algorithm. (**Heller,** C19:59 through C20:2; 'Pre-processor to provide pre-process performance data' of applicant is equivalent to 'driver/sensor circuitry to gather data' of Heller.) It would have been obvious to a person having ordinary skill in the art at the time of applicant's invention to modify the teachings of Ottesen by alter incoming data as taught by Heller to have a pre-processor configured to pre-process performance data to provide input data for the failure prediction algorithm.

For the purpose of putting the incoming data into a form which the invention can

use.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed
or described as set forth in section 102 of this title, if the differences between the
subject matter sought to be patented and the prior art are such that the subject
matter as a whole would have been obvious at the time the invention was made
to a person having ordinary skill in the art to which said subject matter pertains.
Patentability shall not be negatived by the manner in which the invention was
made.

Claims 11, 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over

the combination of Ottesen, Heller, Awadallah and Jones in view of Guay (U.S. Patent

6553369, referred to as **Guay)**

Claim 11

Ottesen, Awadallah and Jones do not teach the determination module is further

configured to map the result from the failure prediction algorithm to one of a plurality of

predefined recommendations.

Heller teaches the determination module is further configured to map the

result(**Heller,** abstract; Heller discloses output from sensors being intregrated ito a host

microcomputer to produce test results.) from the failure prediction algorithm to one of a plurality of predefined recommendations. (**Guay,** C5:62 through C6:8; 'Predefined recommendations' of applicant is equivalent to 'providing recommendations' of Guay.) It would have been obvious to a person having ordinary skill in the art at the time of applicant's invention to modify the combined teachings of Ottesen,, Awadallah and · Jones by using predefined recommendations as taught by Heller and Guay to have the determination module is further configured to map the result from the failure prediction algorithm to one of a plurality of predefined recommendations.

For the purpose of the invention to supply commonly used recommendations to reduce computing time and resources.

Claim 12

Ottesen, Heller, Awadallah and Jones do not teach a notification module configured to produce a notification in response to the result.

Guay teaches a notification module configured to produce a notification in response to the result. (**Guay,** C5:62 through C6:8; 'Producing a notification' of applicant is equivalent to the output of 'providing recommendations' of Guay.) It would have been obvious to a person having ordinary skill in the art at the time of applicant's invention to modify the combined teachings of Ottesen, Heller, Awadallah and Jones byoutputting a response as taught by Guay to have a notification module configured to produce a notification in response to the result.

For the purpose of the invention to output a result which the user can access and

use

Conclusion

5.   The prior art of record and not relied upon is considered pertinent to the

applicant's disclosure.

-U. S. Patent Publication 20030055666: Robby

-U. S. Patent Publication 20020162056: Forman

-U. S. Patent Publication 20030112538: Smith

-U. S. Patent Publication 20030048720: Yamamoto

-U. S. Patent Publication 20030016462: Gong

-U. S. Patent Publication 20020053046: Gray

-U. S. Patent 6574754: Smith

-U. S. Patent 6571310: Ottesen

-U. S. Patent 6489738: Bates

-U. S. Patent 6460151: Warwick

-U. S. Patent 6415189: Hajji

-U. S. Patent 6266199: Gillis

-U. S. Patent 6237114: Wookey

-U. S. Patent 5923876: Teague

-U. S. Patent 5917724: Brousseau

-U. S. Patent 5914967: Yomtoubian

6.   Claims 1-40 are rejected.

Correspondence Information

7.   Any inquiry concerning this information or related to the subject disclosure should

be directed to the Examiner Peter Coughlan, whose telephone number is (571) 272-

5990. The Examiner can be reached on Monday through Friday from 7:15 a.m. to 3:45

p.m.

        If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's

supervisor David Vincent can be reached at (571) 272-3687. Any response to this

office action should be mailed to:

        Commissioner of Patents and Trademarks,

        Washington, D. C. 20231;

Hand delivered to:

        Receptionist,

        Customer Service Window,

        Randolph Building,

        401 Dulany Street,

        Alexandria, Virginia 22313,

(located on the first floor of the south side of the Randolph Building);

or faxed to:

(571) 273-8300 (for formal communications intended for entry.)

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866-217-9197 (toll free).

DAVID VINCENT
SUPERVISORY PATENT EXAMINER

Peter Coughlan

12/5/2006